

WHAT IS CLAIMED IS:

1. A process for generating chlorine dioxide from chlorous acid which comprises contacting chlorous acid with a catalytic material in a moist environment for a time sufficient to form chlorine dioxide.
2. A process for generating chlorous acid which comprises contacting a chlorite salt precursor with a cation exchange material in the hydrogen form in a moist environment for a time sufficient to form chlorous acid.
3. The process as described in Claim 2 wherein said cation exchange material is mixed with an additive.
4. A process for generating chlorous acid which comprises contacting a chlorate salt precursor with a cation exchange material in the hydrogen form in a moist environment for a time sufficient to form chlorous acid.
5. The process as described in Claim 4 wherein said cation exchange material is mixed with an additive.
6. A process for generating chlorous acid which comprises contacting a chlorate salt precursor and an acid with an anion

exchange material in a reducing ionic form in a moist environment for a time sufficient to form chlorous acid.

7. The process as described in Claim 6 wherein said anion exchange material is mixed with an additive.

8. A process for generating chlorous acid which comprises contacting an acid with an anion exchange material in the chlorate form in a moist environment for a time sufficient to form chlorous acid.

9. The process as described in Claim 8 wherein said anion exchange material is mixed with an additive.

10. A process for generating chlorous acid and chlorine dioxide which comprises contacting a chlorite salt precursor with a cation exchange material in the hydrogen form and a catalytic material in a moist environment for a time sufficient to form chlorous acid and chlorine dioxide together.

11. The process as described in Claim 10 wherein said catalytic material is on said cation exchange material.

12. The process as described in Claim 10 wherein said catalytic material is an ion exchange material.

13. A process for generating chlorous acid and chlorine dioxide which comprises contacting a chlorite salt precursor and an acid with a catalytic material in a moist environment for a time sufficient to form chlorous acid and chlorine dioxide together.

14. The process as described in claim 13 wherein said catalytic material is on said cation exchange material.

15. The process as described in Claim 13 wherein said catalytic material is an ion exchange material.

16. A process for generating chlorous acid and chlorine dioxide which comprises contacting a chlorate salt precursor with a cation exchange material in the hydrogen form and a catalytic material in a moist environment for a time sufficient to form chlorous acid and chlorine dioxide together.

17. A process as described in Claim 16 wherein said catalytic material is on said cation exchange material.

18. A process as described in Claim 16 wherein said catalytic material is an ion exchange material.

19. A process for generating chlorous acid and chlorine dioxide which comprises contacting a chlorate salt precursor and an

acid with a catalytic material in a moist environment for a time sufficient to form chlorous acid and chlorine dioxide together.

20. The process as described in Claim 19 wherein said catalytic material is on an ion exchange material.

21. The process as described in Claim 19 wherein said catalytic material is an ion exchange material.

22. The process as described in Claim 19 wherein said catalytic material is an ion exchange material in a reducing ionic form.

23. A process for generating chlorous acid and chlorine dioxide which comprises contacting an acid with an anion exchange material in the chlorate form and <sup>a</sup> ~~one~~ catalytic material in a moist environment for a time sufficient to form chlorous acid and chlorine dioxide together.

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24. The process as described in Claim 23 wherein said catalytic material is on said anion exchange material.

25. A process as described in Claim 23 wherein said catalytic material is an ion exchange material.

26. The process as described in Claim 23 wherein said acid is a reducing agent.

27. The process as described in Claim 23 wherein said acid is mixed with a reducing agent.

28. A process for purifying a chlorous acid solution which comprises contacting said chlorous acid solution with an ion exchange material in a moist environment for a time sufficient to remove unwanted ions from said chlorous acid solution.

29. The process as described in Claim 28 wherein said ion exchange material is mixed with an additive.

30. A process for purifying a chlorine dioxide solution which comprises contacting said chlorine dioxide solution with an ion exchange material in a moist environment for a time sufficient to remove unwanted ions from said chlorine dioxide solution.

31. The process as described in Claim 30 wherein said ion exchange material is mixed with an additive.

32. A process for substituting desirable ions for undesirable ions in a chlorous acid solution which comprises contacting said chlorous acid solution with an ion exchange material containing

said desirable ions in a moist environment for a time sufficient to substitute said desirable ions for said undesirable ions in said chlorous acid solution.

33. The process as described in Claim 32 wherein said ion exchange material is mixed with an additive.

34. The process as described in Claim 32 wherein said desirable ion is a stabilizing ion.

35. A process for substituting desirable ions for undesirable ions in a chlorine dioxide solution which comprises contacting said chlorine dioxide solution with an ion exchange material containing said desirable ions in a moist environment for a time sufficient to substitute said desirable ions for said undesirable ions in said chlorine dioxide solution.

36. The process as described in Claim 35 wherein said ion exchange material is mixed with an additive.

37. The process as described in Claim 35 where said desirable ion is a stabilizing ion.

38. A process for adjusting the pH of a chlorous acid solution which comprises contacting said chlorous acid solution

with an ion exchange material in a moist environment for a time sufficient to adjust the pH of said chlorous acid solution.

39. The process as described in Claim 38 wherein said ion exchange material is mixed with an additive.

40. A process for adjusting the pH of a chlorine dioxide solution which comprises contacting said chlorine dioxide solution with an ion exchange material in a moist environment for a time sufficient to adjust the pH of said chlorine dioxide solution.

41. The process as described in Claim 40 wherein said ion exchange material is mixed with an additive.